



YAKEEN-2022

Solution [DPP-3]

1. Benzene and toluene forms an ideal solution. Vapour pressure of pure benzene is 100 torr while that of pure toluene is 50 torr. If mole fraction of benzene in liquid phase is $\frac{1}{3}$. Then calculate the of mole fraction of benzene in vapour phase.
 (A) $\frac{2}{3}$ (B) $\frac{1}{2}$
 (C) $\frac{2}{5}$ (D) $\frac{1}{3}$
2. Mole fraction of the toluene in the vapour phase which is in equilibrium with a solution of benzene ($p^\circ = 120$ torr) and toluene ($p^\circ = 80$ torr) having 2.0 mol of each is:
 (A) 0.50 (B) 0.25
 (C) 0.60 (D) 0.40
3. At 40°C , vapour pressure in torr of methanol and ethanol solution is $P = 119x + 135$, where x is the mole fraction of methanol. Hence:
 (A) vapour pressure of pure methanol is 119 torr
 (B) vapour pressure of pure ethanol is 135 torr
 (C) vapour pressure of equimolar mixture of each is 127 torr
 (D) mixture is completely immiscible.
4. Benzene and toluene form an ideal solution. The vapour pressure of benzene at 55°C is 400 mm Hg while the vapour pressure of toluene at 55°C is 130 mm Hg. What is the vapour pressure of a solution consisting of 0.5 mole fraction of benzene and 0.5 mole fraction of toluene at 55°C ?
 (A) Lower than 130 mm Hg
 (B) Between 130 and 400 mm Hg
 (C) Exactly 400 mm Hg
 (D) Greater than 400 mm Hg
5. Ideal solution is formed when its components
 (A) have zero heat of mixing only
 (B) have zero volume change on mixing only
 (C) have zero heat of mixing and zero volume change
 (D) can be converted into gases
6. Equal moles of benzene and toluene are mixed the V.P. of benzene and toluene in pure state are 700 and 600 mm Hg respectively. The mole fraction of benzene in vapour state is
 (A) 0.7 (B) 0.47
 (C) 0.50 (D) 0.54
7. In ideal solution of non-volatile solute B in solvent A in 2 : 5 molar ratio has vapour pressure 250 mm. If an another solution in the ratio 3 : 4 prepared then vapour pressure above this solution is
 (A) 200 mm (B) 250 mm
 (C) 350 mm (D) 400 mm
8. The vapour pressure of pure A is 10 torr and at the same temperature when 1 g of B is dissolved in 20 gm of A, its vapour pressure is reduced to 9.0 torr. If the molecular mass of A is 200 amu, then the molecular mass of B is:
 (A) 100 amu (B) 90 amu
 (C) 75 amu (D) 120 amu
9. If an ideal solution is made by mixing 2 moles of benzene ($p^\circ = 266$ mm-Hg) and 3 moles of another liquid ($p^\circ = 236$ mm-Hg). The total vapour pressure of the solution at the same temperature would be
 (A) 502 mm-Hg (B) 248 mm-Hg
 (C) 600 mm-Hg (D) 250.6 mm-Hg

10. Among the following mixtures, dipole-dipole as the major interaction, is present in
 (A) Benzene and CCl_4
 (B) Benzene and $\text{C}_2\text{H}_5\text{OH}$
 (C) CH_3COCH_3 and CH_3CN
 (D) KCl and water
11. For an ideal solution with $P_A^0 > P_B^0$, which of the following is true?
 (A) $\chi_{A(l)} = \chi_{A(v)}$
 (B) $\chi_{A(l)} > \chi_{A(v)}$
 (C) $\chi_{A(l)} < \chi_{A(v)}$
 (D) No relationship in their mole fraction
12. Which of the following form ideal solution?
 (A) $\text{C}_6\text{H}_5\text{Cl} + \text{C}_6\text{H}_5\text{Br}$
 (B) $\text{C}_6\text{H}_6 + \text{C}_6\text{H}_5\text{CH}_3$
 (C) Hexane + Heptane
 (D) All of these
13. Which condition is not satisfied by an ideal solution?
 (A) $\Delta_{\text{mix}} H = 0$
 (B) $\Delta_{\text{mix}} V = 0$
 (C) $\Delta_{\text{mix}} S = 0$
 (D) Obedience to Raoult's Law
14. Which one is not equal to zero for an ideal solution?
 (A) $\Delta P = P_{\text{observed}} - P_{\text{Raoult}}$
 (B) ΔH_{mix}
 (C) ΔS_{mix}
 (D) ΔV_{mix}
15. Formation of a solution from two components can be considered as
 (i) pure solvent \rightarrow separated solvent molecules, ΔH_1
 (ii) pure solute \rightarrow separated solute molecules, ΔH_2
 (iii) separated solvent and solute molecules \rightarrow solution, ΔH_3 .
 Solution so formed will be ideal if
 (A) $\Delta H_{\text{soln}} = \Delta H_1 + \Delta H_2 + \Delta H_3$
 (B) $\Delta H_{\text{soln}} = \Delta H_1 + \Delta H_2 - \Delta H_3$
 (C) $\Delta H_{\text{soln}} = \Delta H_1 - \Delta H_2 - \Delta H_3$
 (D) $\Delta H_{\text{soln}} = \Delta H_3 - \Delta H_1 - \Delta H_2$



ANSWERS

1. (B)
2. (D)
3. (B)
4. (B)
5. (C)
6. (D)
7. (A)
8. (B)
9. (B)
10. (C)
11. (C)
12. (D)
13. (C)
14. (C)
15. (A)



Note - If you have any query/issue

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